



John F. Kennedy Space Center's Systems Maintenance Automated Repair Tasks (SMART)



The National Aeronautics and Space Administration (NASA) seeks partners interested in the commercial application of the Systems Maintenance Automated Repair Tasks (SMART) technology. SMART is an interactive decision analysis and refinement software system designed to use evaluation criteria for discrepant conditions to automatically populate a document with the steps necessary to repair a discrepancy in a safe, accurate, and efficient method. SMART was originally developed for the Orbiter Electrical Engineering group, part of the Space Shuttle Ground Operations team that is responsible for all electrical interconnect modifications, inspections, and discrepancy repairs. Implemented at Kennedy Space Center with great success, SMART has been instrumental in avoiding costs, saving time, ensuring requirements are met, capturing knowledge, and improving quality, technical accuracy, and safety.

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BENEFITS

- **Time Savings:** Time required to produce repair documents reduced by up to 50%
- **Minimizes Human Error:** Typographical and cut-and-paste errors reduced or eliminated
- **Consistent Disposition:** Uses controlled set of repair sequences and steps
- **Consistent Evaluation:** Provides method for consistent evaluation of discrepancies
- **Transferable:** Product and concept are transferable to many different engineering disciplines and hardware types
- **Safety:** Ensures proper procedures are followed, preventing injuries and hardware damage
- **Knowledge:** Provides a tool to capture valuable knowledge about a system. Knowledge goes in and out of SMART in the same way a person uses information to solve problems.
- **Intellectual Capital:** Provides a mechanism to retain/transfer institutional knowledge of system processes

technology ■ opportunity

APPLICATIONS

- Commercial/Military Aviation
- Commercial/Military Spacecraft
- Automotive
- Industrial Process Machines
- Nuclear
- Marine
- Electronics

TECHNOLOGY STATUS

- ☒ Patent pending
- ☐ U.S. patent
- ☒ Copyrighted
- ☒ Available to license
- ☐ Available for no-cost transfer
- ☐ Seeking industry partner for further codevelopment

Technology Details

SMART gives the user a single interface point that merges information on the configuration, safety and technical requirements, corporate knowledge, sequential process, decision analysis process, and hardware requirements, all of which previously had to be manually compiled from multiple sources and databases, to create a repair procedure. It is a front-end, on-line application whose Oracle-based output can be used by any repair-procedure-authoring environment. SMART captures information from existing legacy database systems and provides that data for incorporation into a repair procedure document. This flexible software allows the SMART configuration to be tailored to meet organizational needs.

Partnership Opportunities

NASA has acquired a copyright for the SMART software, has applied for a U.S. patent, and is seeking licensees for the patent and copyright. NASA has the authority to grant licenses on its domestic and foreign patents and patent applications pursuant to 35 U.S.C. 207-209. NASA has implemented this authority by means of the NASA Patent Licensing Regulations, 37 CFR § 404. All NASA licenses are individually negotiated with the prospective licensee, and each license contains terms concerning commercialization (practical application), license duration, royalties, and periodic reporting. NASA patent licenses may be exclusive, partially exclusive, or nonexclusive. Companies interested in the SMART technology, or desiring additional information, should reference Case Number KSC-12909 and contact:

Lew Parrish
Innovative Partnerships Program
Mail Code: KT-A2
Kennedy Space Center, FL 32899
Telephone: (321) 867-5033
Fax: (321) 867-2050
Lewis.M.Parrish@nasa.gov